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**3 Exam Questions Yr 1**  
**Algebraic Methods - Factor Theorem**

- (1) Given  $(x - 3)$  and  $(x + 2)$  are factors of  $px^3 - x^2 + qx - 6$  find the values of  $p$  and  $q$ .
- (2)  $f(x) = 3x^3 - x^2 - 19x - 15$
- (a) Show that  $(x + 1)$  is a factor of  $f(x)$ .
- (b) Hence sketch the graph of  $y = f(x)$  showing any points of intersection with the coordinate axes.
- (3) Show that there is only one real root to the equation  $x^3 + x - 2 = 0$ .

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